**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

## Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the James Spinymussel

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** The Service determines endangered status for the James spinymussel (*Pleurobema collina*). This species survives only in a few headwater streams of the James River in Virginia and West Virginia. This action is being taken because: (1) The range and numbers of this freshwater mussel have been drastically reduced to about 5–10% of historic levels, and (2) the few drainages that continue to support the species are subject to threats including invasion of essential habitats by the exotic Asiatic clam (*Corbicula fluminea*) and potential water quality degradation by agricultural and silvicultural runoff, effluent from sewage treatment plants, and chemical spills. This rule will implement Federal protection provided by the Endangered Species Act of 1973, as amended.

**DATE:** The effective date of this rule is August 22, 1988.

**ADDRESSES:** The complete file for this rule is available for inspection by appointment, during normal business hours at the Annapolis Field Office, U.S. Fish and Wildlife Service, 1825B Virginia Street, Annapolis, Maryland 21401.

**FOR FURTHER INFORMATION CONTACT:** Mr. G. Andrew Moser at the above address (301/269–6324).

**SUPPLEMENTARY INFORMATION:**

### Background

The James spinymussel was first discovered in the Calfpasture River, Rockbridge County, Virginia, by T. A. Conrad in 1836 (Conrad 1846). The species was originally described by

Conrad (1837) as *Unio collinus*. It has been subsequently placed in different genera by various workers. Names that refer to this species are listed in the following abbreviated synonymy:

*Unio collinus* Conrad, 1936: Plate 36, Figure 2.

*Margaron (Unio) collinus* (Conrad).—Lea 1852:23.

*Alasmidonta collina* (Conrad).—Simpson 1900:669

*Canthyria collina* (Conrad).—Frierson 1927:1946; Stansbery 1971:14; Clarke and Neves 1984; Zeto and Schmidt 1984:147

*Elliptio (Canthyria) collina* (Conrad).—Morrison 1955:20.

*Pleurobema collina* (Conrad).—Boss and Clench 1967:45; Heard 1970:27; Burch 1975:12.

*Pleurobema (Lexingtonia) collina* (Conrad).—Johnson 1970:300.

*Fusconaia (Lexingtonia) collina* (Conrad).—Johnson and Clarke 1983:296.

The Service recognized the James spinymussel under the name *Fusconaia collina* in the Review of Invertebrate Wildlife for Listing as Endangered or Threatened Species (49 FR 21675; May 22, 1984). Clarke and Neves (1984) subsequently determined that the James spinymussel uses only its outer gills to brood glochidia and is therfore not a *Fusconaia*, which are currently understood to use all four gills to brood glochidia. Clarke and Neves (1984) suggested placement of the species in the genus *Canthyria*, because of the presence of spines on the shell and some characters of the soft anatomy. The Service believes that until further review and evaluation clarifies the taxonomic significance of these characters, the James spinymussel should be recognized under the more established name *Pleurobema collina*.

The Service's Review of Invertebrate Wildlife included this species under the common name "Virginia spiny mussel." The Service is following the list of common names by Turgeon *et al.* (in press) in now using the name James spinymussel.

The shells of juvenile James spinymussels usually bear one to three short but prominent spines on each valve. The shells of adults usually lack spines. The foot and mantle of the adult are conspicuously orange and the mantle is darkly pigmented in a narrow band around and within the edges of the branchial and anal openings.

Aside from the James spinymussel, only two other freshwater spined mussels are known to exist: *Elliptio (Canthyria) spinosa*, a large-shelled and long-spined species known only from the Altamaha River system in Georgia, and *Elliptio (Canthyria) steinstansana*, a species with intermediate shell size and spine length found only in the Tar River in North Carolina. The latter species was listed as endangered on June 27, 1985 (50 FR 26575). The James spinymussel has a smaller shell and shorter spines than these other two species.

The James spinymussel has been collected on sand and mixed sand and gravel substrates, generally in areas of slow to moderate current and relatively hard water. Like other freshwater mussels, it feeds by filtering food particles from the water, a characteristic that makes it particularly susceptible to detrimental effects of water-borne pollutants. *P. collina* also shares with other freshwater mussels a complex reproductive cycle in which the mussel larvae attach for a short time to a fish host. The life span, time of spawning, host fish species, and many other aspects of the life history of *P. collina* are still unknown.

Collection records indicate that the James spinymussel was once widely distributed in the James River drainage upstream of Richmond. All pre-1983 records for the species are from Virginia (Clarke and Neves 1984). They include: The James River, main stem, in Rockbridge, Botetourt, Fluvanna, Buckingham, Goochland, and Cumberland Counties; the Rivanna River in Fluvanna County; Mill Creek in Bath County; the Calfpasture River in Rockbridge County, and Johns Creek in Craig County. The James spinymussel was first reported from West Virginia in 1984 (Zeto and Schmidt 1984). This mussel is known to survive in only four creeks: Craig, Catawba, and Johns Creeks in Craig and Botetourt Counties, Virginia, and Potts Creek in Monroe County, West Virginia (Clarke and Neves 1984, M.C. Hove letter of comment).

Although it is probable that the decline of the James spinymussel began with municipal growth and industrialization of cities and towns in the James River watershed, much of the decline has occurred in the last 20 years. The species remained in much of its historic range through the mid-1960's, but has since disappeared from the majority of known sites. It now appears to be extirpated from 90–95% of its historic range, with survival documented only in four headwater creeks in the James River drainage. This restricted distribution makes the species vulnerable to threats including water quality perturbations, disease, and displacement by expanding populations of the exotic Asiatic clam (*Corbicula fluminea*).

In the **Federal Register** of May 22, 1984 (49 FR 21675), the James spinymussel was included in category 2 of the Service's Review of Invertebrate Wildlife. Category 2 comprises those taxa for which proposed listing is possibly appropriate but for which conclusive data on biological vulnerability are not available to support a proposed rule. Additional data, including a Service-funded status survey (Clarke and Neves 1984), provided the information needed to support a listing proposal. On September 1, 1987, the Service published in the **Federal Register** (52 FR 32939) a proposed rule to list the James spinymussel as an endangered species.

*Pleurobema collina* was placed on Virginia's state list of endangered species on October 1, 1987.

**Summary of Comments and Recommendations**

In the September 1, 1987, proposed rule (52 FR 32939) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. A newspaper notice was published in the Roanoke Times and World News on September 11, 1987, which invited general public comment. Six comments were received and are discussed below.

Letters supporting the listing were received from the Virginia Department of Game and Inland Fisheries, the West Virginia Department of Natural Resources, the Nature Conservancy, and Dr. Arthur H. Clarke, a malacologist with Ecosearch, Inc. The Virginia Department of Game and Inland Fisheries letter indicated that they had designated the James spinymussel a State endangered species. This has been noted in the "Background" section of this rule.

Dr. Arthur Clarke's letter indicated that he would place this species in either the genus *Canthyria* or *Elliptio*, rather than *Pleurobema*. For the reasons given in the "Background" section, we plan to continue using the more established name, *Pleurobema*. Research currently underway at Virginia Polytechnic Institute and State University may provide the necessary information to settle this issue. Because of their frequent usage, we have added the generic names *Elliptio* and *Canthyria* as

synonyms in the table to be included in the list of Endangered and Threatened Wildlife (50 CFR 17.11).

A researcher at the Department of Fisheries and Wildlife Science at the Virginia Polytechnic Institute and State University provided additional information on the distribution of the James spinymussel, including the discovery of a small population in Catawba Creek in Botetourt County Virginia. Information on this new population has been incorporated in the "Background" section.

The County Planner and Zoning Administrator for Botetourt County, Virginia, provided comments indicating that minor modifications of the spinymussel's habitat may occur due to the slow, but inevitable, growth/development which the upper reaches of the James River drainage will experience.

**Summary of Factors Affecting the Species**

After a thorough review and consideration of all information available, the Service has determined that the James spinymussel should be classified as an endangered species. Procedures found at section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the James spinymussel (*Pleurobema collina*) are as follows:

*A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range*

Results of recent surveys of the James River drainage (Clarke and Neves 1984, M. C. Hove letter of comment) have documented survival of the James spinymussel only in Craig, Catawba and Johns Creeks in Craig and Botetourt Counties, Virginia, and a short reach of Potts Creek in Monroe County, West Virginia. This represents a very significant reduction (90–95%) in known range, as historic records indicate that the species was once found throughout much of the James River drainage upstream of Richmond.

Habitat modification has been a major factor in the James spinymussel's abrupt decline. Adverse habitat changes including dam construction, industrial pollution, chemical spills, channelization, and sewage discharges have occurred at various locations within the species' historic range in the James River drainage. Current threats to habitat in the Craig/Johns Creek and Potts Creek watersheds include the following:

(1) Effluent discharges and accidental discharges of chlorine or raw sewage from sewage treatment plants;

(2) Erosion and siltation resulting from logging operations in the upper Craig Creek Watershed and other locations;

(3) Toxic chemical spills;

(4) Agricultural runoff including pesticides and fertilizers;

(5) Channelization.

*B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Although collection was probably an insignificant factor in this species' decline, it is becoming a problem now that the species is rare. Because additional interest in the spinymussel is expected to be generated by the listing process, the Service is concerned that this problem may worsen in the future.

*C. Disease or Predation*

There is no evidence that disease or predation has been a problem for the James spinymussel. However, extensive mussel dieoffs, possibly caused by a yet unknown disease, have occurred recently in the rivers of southwest Virginia, in the Tar River in North Carolina, and in numerous other locations. The Tar River dieoff, discovered in May 1986, was particularly severe, killing an estimated 75% of all mussels in the affected beds (R. Neves personal communication). Should such an outbreak occur in the Craig Creek or Potts Creek drainages, it would pose a very serious threat to the James spinymussel because of the species' restricted range.

*D. The Inadequacy of Existing Regulatory Mechanisms*

Virginia State law (Section 29–113) requires a permit for the scientific collection of freshwater mussels. State law (Article 6, Chapter 3, Title 29.1 of the Code of Virginia) also declares it unlawful to take, transport, process, sell or offer for sale any threatened or endangered species. However, these State laws are difficult to enforce and do not protect the species' habitat from the potential impacts of Federal projects. Federal listing would provide protection for the species under the Endangered Species Act by requiring a Federal permit to take the species and requiring Federal agencies to consult with the Service when projects they fund, authorize, or carry out may affect the species.

*E. Other Natural or Manmade Factors Affecting its Continued Existence*

Much of the James River drainage has become infested by the Asiatic clam (*Corbicula fluminea*), a species introduced accidentally from Asia. Competition from this non-native species may be a principal cause of the James spinymussel's decline. Population densities of *C. fluminea* in excess of 1000 individuals per square meter (about 93 per square foot) have been reported in the James River downstream of Richmond (Diaz 1974). Because of the Asiatic clam's high population densities, its feeding activity may significantly reduce the availability of phytoplankton needed by the spinymussel for food and may interfere with reproduction of the spinymussel by filtering its sperm from the water column (Clarke 1981). Clarke and Neves (1984) consider the temporal correlation between the disappearance of downstream populations of the James spinymussel and the appearance and proliferation of the Asiatic clam to be clear evidence that the spread of *Corbicula* is one of the chief causes of the spinymussel's decline.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the preferred action is to list the James spinymussel as endangered. The mussel's small population and restricted distribution make it vulnerable to pollution events, disease, and competition from exotic species; its range has greatly narrowed within the immediate past; therefore, threatened status would not be appropriate. The reasons for not designating critical habitat for this species are discussed below in the "Critical Habitat" section.

**Critical Habitat**

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for the James spinymussel at this time. This rare mussel is very unusual, being one of only three known species of spined freshwater mussels. There is a small but significant demand by collectors for this species. Because of this, the Service believes a detailed description of the species' habitat, required as part of any critical habitat designation, could increase the species' vulnerability to illegal taking and

increase law enforcement problems. Therefore, it would not be prudent to designate critical habitat for this species. Doing so would draw attention to the habitats supporting the James spinymussel and risk depletion of an already limited population.

### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and local governments and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal activities that could impact the James spinymussel and its habitat include, but are not limited to, the following: Issuance of permits for mineral exploration, timber sales, recreational development, stream alterations, road and bridge construction and maintenance, and implementation of forest management plans. It has been the experience of the Service that the large majority of section 7 consultations are resolved so that the species is protected and the project can continue.

The Act and its implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been illegally taken. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Applicable regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

### National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined by the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

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### Author

The primary author of this final rule is G. Andrew Moser, Annapolis Field Office, U.S. Fish and Wildlife Service, 1825B Virginia Street, Annapolis, Maryland 21401 (301/269–6324).

### List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

### Regulation Promulgation

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

## PART 17—[AMENDED]

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93–205, 87 Stat 884; Pub. L. 94–359, 90 Stat. 911; Pub. L. 95–632, 92 Stat. 3751; Pub. L. 96–159, 93 Stat. 1225; Pub. L. 97–304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*); Pub. L. 99–625, 100 Stat. 3500 (1986), unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under

CLAMS, to the List of Endangered and Threatened Wildlife:

§ 17.11 **Endangered and threatened wildlife.**

(h) * * *

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| Species | | Historic range | Vertebrate population where endangered or threatened | Status | When listed | Critical habitat | Special rules |
|---|---|---|---|---|---|---|---|
| Common name | Scientific name | | | | | | |
| Clams: | | | | | | | |
| Spinymussel, James (=Virginia spiny mussel). | *Pleuroberna* (=*Fusconaia*, =*Elliptio*, =*Canthyria*) *collina*. | U.S.A. (VA, WV). | NA | E | 316 | NA | NA |

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Dated: June 27, 1988.

**Susan Recce,**

*Acting Assistant Secretary for Fish and Wildlife and Parks.*

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